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10 December 2014

Version of attached file:

Accepted Version

Peer-review status of attached file:

Peer-reviewed

Citation for published item:

Witcher, R.E. (2013) 'On Rome's ecological contribution to British flora and fauna : landscape, legacy and identity.', *Landscape history*, 34 (2). pp. 5-26.

Further information on publisher's website:

<http://dx.doi.org/10.1080/01433768.2013.855393>

Publisher's copyright statement:

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Witcher, R.E. (2013) On Rome's Ecological Contribution to British Flora and Fauna: Landscape, Legacy and Identity. *Landscape History*, 34(2): 5-26.

On Rome's ecological contribution to British flora and fauna: landscape, legacy and identity

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Abstract

This paper addresses the flora and fauna of Roman Britain via two long-lived and closely-related notions: the 'Roman introduction' and the 'living legacy'. These concepts connect knowledge and beliefs about the introduction of new species during the Roman period with the idea of direct and enduring biological inheritance in post-Roman societies. The paper explores both the popular and academic prominence of the Romans as agents of ecological change with effects on landscape, identity and diet which are still discernible and resonant today. These notions demonstrate wide currency, from popular stories through to scientific research.

Today, archaeobotany and zooarchaeology are the primary means of documenting the flora and fauna of Roman Britain. Yet the discipline of archaeology came late to this topic. This paper outlines the evolving sources of evidence used over the past 400 years to identify those species introduced during the Roman period. This includes consideration of the reception of classical texts, linguistic etymology and genetic analysis. An overarching narrative behind these concepts is the colonial theoretical framework of 'Romanisation', or the genealogical appropriation of the Romans as 'our' cultural and biological ancestors.

Despite interest in the reception of Rome and its archaeological remains, scholars have been slow to recognise the centrality of flora and fauna for understanding historical and contemporary perceptions of the Roman past. This paper opens a new avenue of research by calling attention to the intellectual biography of the dominant interpretive frameworks which structure both scientific approaches to the collection and interpretation of data and popular attitudes towards landscape and identity.

Keywords

flora; fauna; native/indigenous species; alien/introduced species; ecology; Roman Britain; British landscape; identity; diet

1. Introduction

This paper addresses the flora and fauna of Roman Britain and explores two long-lived and closely-related notions: the 'Roman introduction' and the 'living legacy'. These recurrent concepts connect knowledge and belief about the introduction of new species during the Roman period with the idea of direct and enduring biological inheritance in post-Roman societies. The aim is to explore the popular and academic prominence of the Romans as agents of ecological change with effects still discernible and resonant today.

The paper outlines the evolving sources of evidence used to identify which species were introduced during the Roman period and considers the historical relationships between popular, antiquarian and academic accounts. Today, archaeobotany and zooarchaeology are the primary means of documenting the flora and fauna of Roman Britain. Yet the discipline of archaeology came late to the topic and has not established the same authority over understanding as it has in relation to monuments and artefacts. Indeed, biologists, conservationists, art historians, and gardening and cookery writers are more likely to shape general knowledge of which plants and animals are Roman introductions. The assertion, however, is not that archaeology should necessarily exert such authority but rather that it is important to establish the environment in which such archaeological accounts compete. It is beyond the scope of this paper to review systematically the claims for each species against the archaeological database; rather the paper's aim is to evaluate the political and cultural motives for, and significance of, popular and academic claims about Roman introductions and their legacy.ⁱ

2. Identities

For centuries, Rome's colonial legacy in Britain has been measured through the remains of military frontiers, mosaics and pottery. But this legacy is not restricted to architecture and durable material culture. In recent decades, archaeologists have generated large archaeobotanical and zooarchaeological datasets with which to examine the ecological changes of the Roman period, including the introduction of new plants and animals. Awareness, however, that new species were introduced during the Roman period long pre-dates the systematic collection of seeds, macrofossils and bones. Indeed, long before the excavation and display of monuments began during the nineteenth-century, plants and animals were understood as links between the British landscape and the Roman past. Alongside the remains of archaeological monuments, this ecological legacy continues to play an important role in perceptions of the Roman past today. In particular, there is a recurrent notion that the species introduced by the Romans represent a living legacy, connecting the past and present through direct ecological and cultural descent.

The wide currency of the Roman introduction is attested in countless popular books, websites, newspaper articles, and cooking and gardening magazines which assert that species x 'was introduced by the Romans'. The list encompasses fruits, nuts, vegetables, herbs, flowers, birds and mammals, including apple, cherry, grape vine, mulberry, pear, plum, sweet chestnut, walnut, asparagus, carrot, celery, cucumber, leek, onion, parsnip, pea, radish, turnip, elm, sycamore, rose, violet, peacock, pheasant, fallow deer, rabbit, brown hare, Roman snail and dormouse. Table 1 lists a selection of these species with an indication of the complexity of evaluating such claims.

This rich and varied list of Roman introductions helps to define the arrival of Roman legions in Britain in A.D. 43 as an ecological and cultural turning point. It simultaneously implies that the preceding Iron Age was dull and in need of enrichment, and that imperial incorporation was the process through which useful and exotic new plants and animals were introduced. Scholarly attention has recently focused on the impact of these new

species on the social and cultural identities of Iron Age communities (e.g. van der Veen *et al.* 2008; Sykes 2012). However, the evaluation of knowledge and beliefs about these Roman introductions in post-Roman societies through to the present has attracted limited academic comment. This situation is surprising given the popularity and persistence of such claims and, arguably, has arisen due to increasing specialisation of disciplines (e.g. archaeology, botany, history, ecology, zoology). Yet, the Roman introduction and the living legacy merit attention because of their ubiquity within both popular and academic narratives and their significance for the politics of identity, history of the environment and, potentially, conservation practices of the future.

A striking characteristic of the claims for Rome's contribution to British ecology is the persistent but cursory way in which it is invoked. Often positioned in introductory paragraphs, it is precisely the brevity and lack of qualification with which many accounts bestow this attribution which makes it so powerful. There is much imprecision in both terminology (e.g. species named only generically) and in the lack of distinction between the introduction of completely new species and the introduction of improved breeds or varieties. Examples of such claims include the web-pages of rare animal breed societies, school text books, and volumes on cookery, gardening, landscape history, trees and flowers. Such claims are rarely, if ever, the dominant theme for discussion, rather it is their presence across a variety of genres which creates a pervasive sense of significance and indirectly establishes this colonial transplant as a key period of ecological and cultural change. And if the introduction of these plants and animals civilised and incorporated prehistoric Britain, their continued presence in the landscape keeps that legacy alive. Indeed, flora and fauna are a more comprehensive and enduring inheritance than the sparse ruins of forts and towns. Animals and plants root Roman civilisation in the wider British landscape, providing direct genetic and cultural continuity – a truly living legacy.

2.1 Alien species

Today the accelerated movement of plants and animals around the planet is understood as one of the most significant threats to global biodiversity (Shine *et al.* 2010). To monitor and manage this movement, international conventions have enshrined the concept of alien and native species, creating a powerful discourse about the relative value of plants and animals within or beyond their 'natural' habitats. The categorisation of alien or native, however, is fraught with practical and political difficulties, both well-illustrated by ongoing attempts of EU countries to formulate common definitions. For example, individual member states use widely differing dates to distinguish alien from native, such as A.D. 1200 in Belgian marine waters and 1943 in neighbouring Flanders (Vandekerckhove & Cardoso 2010). The classification of alien and native species also presents practical problems for biologists who must define the 'natural' distribution of species in order to know when their status shifts from native to alien. In historical perspective, this task is complicated by the actions of humans (e.g. domestication, colonisation) as well as the effects of climate and habitat change.

In broader conceptual terms, the native plants and animals which partly define landscapes are often integral to national identities; alien species may therefore be perceived not simply as unwanted ecological and economic pests, but as profound existential threats. In this context, attempts to exclude or eliminate aliens in order to protect native species implicate conservation within discourses of national identity, border definition and even xenophobia (Milton 2000; Smout 2003; for debate, Preston 2009 & Warren 2007). In the British context, island status and early industrialisation have combined to create an infamously nostalgic attitude towards the landscape, and a keen sense of external threat. Public response to the devastating effects of Dutch elm disease in the 1970s (and the

current threat of ash dieback) well illustrates the intersection of ecology, politics and identity. Perceptions, however, are not always commensurate with historical or contemporary reality; for example, though bright yellow fields of oilseed rape (*Brassica napus*) have been seen to disrupt the visual aesthetic of the historical landscape, Thirsk (1997: 72-9) traces documentary evidence for centuries of cultivation in Britain, and van der Veen *et al.* (2008: table 1) document archaeobotanical evidence from the Roman period. Meanwhile, Pearman & Walker (2009) note the perceived threat from alien species such as Japanese knotweed (*Fallopia japonica*) is often exaggerated because of where it has established (in urban environments) and because of the generalised scale at which it is recorded. Such examples demonstrate the powerful and emotional connections between plants, animals, landscape and identity, both what constitutes 'native', 'British, or 'traditional', and what constitutes 'alien', 'other' or 'threatening'. It should, of course, be noted that 'alien' is a term which is deployed contextually, indicating unwanted or un-useful species: in contrast, gardeners nurture 'exotics' and farmers cultivate 'crops'. Aliens are therefore not simply species in the wrong place, but species which resist human control or do not conform to expectations about usefulness or aesthetics.

Despite its conceptual dominance, the native/alien dichotomy is a recent development. In the British context, a distinction between indigenous and introduced species has been perceived for centuries, but only during the final decades of the twentieth-century did this dichotomy become the primary means of categorising and valuing species. For example, at the beginning of the twentieth-century, plants and animals were classified as either vermin or non-vermin without reference to origin (Smout 2003); as a result, native red squirrels (*Sciurus vulgaris*), which today hold talismanic status for the conservation movement, were indiscriminately persecuted along with non-native grey squirrels (*Sciurus carolinensis*).

Some ecologists have found the alien/native dichotomy increasingly unhelpful, arguing that alien should be split into two sub-categories – archaeophytes (introduced between c.4000 B.C. and A.D. 1500) and neophytes (post-1500) – on the basis that long-established introductions exhibit distinct ecological behaviour (Preston *et al.* 2004: 262-3). For example, many neophytes are invasive species which can rapidly spread; in contrast, some archaeophyte species, especially arable weeds, are now declining or threatened with extinction, often as a result changing agriculture. Currently, legal protection is usually only extended to native species, and therefore some long-established aliens may not receive appropriate protection (Preston *et al.* 2004); two archaeophytes which are afforded protection under the Wildlife and Countryside Act 1981 are Roman snail (*Helix pomatia*) and brown hare (*Lepus europaeus*). The sub-division of alien species into archaeophytes (including species introduced during the Roman period) and neophytes therefore has ecological, legal, and as discussed below, cultural significance.

Notwithstanding the practical and moral issues outlined above, the alien/native dichotomy remains the dominant classificatory framework for most biologists, governments and public alike. Against a background of suspicion towards alien species, it is striking that the majority of species widely considered to be Roman introductions are perceived as beneficial additions. This positive evaluation takes two forms: Roman introductions as enriching and exotic and, conversely, Roman introductions as familiar and mundane. Significantly, these perceptions are not mutually exclusive: the adoption of alien species symbolises the successful incorporation of prehistoric Britain into a wider Mediterranean civilisation, a necessary cultural and ecological transplant from the Continent to kickstart national historical development. Many of these non-native species, however, have subsequently become not only familiar but quintessentially British, woven into the cultural

landscape through diet, literature, history and art. Simultaneously, these species are alien *and* British, they are exotic *and* familiar.

2.2 Ancient & contemporary identities

If a farmer from pre-Roman times were to return to Britain today, he would be amazed at the variety of trees and shrubs growing in the countryside... It was the Romans who began the diversification of Britain's treescape. (Reader's Digest 1981, p.288).

There has been much scholarly attention to the relationship between plants, animals, landscapes and national identities (e.g. Pauly 1996; Schama 1996). The focus of these studies, however, is the last 500 years; the significance – real or perceived – of earlier contributions to the British landscape is comparatively neglected. Archaeologists have documented the character of the Roman landscape in detail (e.g. Dark & Dark 1997). They have also examined the ways in which the discovery and presentation of Roman monuments and artefacts are implicated in the construction of contemporary identities (e.g. Hingley 2000). Scholars have not yet, however, combined these approaches to look at the evidence for, and reception of, Rome's contribution to the British landscape and its defining flora and fauna.

In particular, the positive evaluation of the ecological and cultural contribution of Roman introductions is significant, contrasting sharply with attitudes towards contemporary alien species. This situation can be understood in terms of the genealogical narrative of Romanisation, that is, the theory of cultural change first expounded by Francis Haverfield in 1906 to explain the incorporation of Rome's provinces. Although Haverfield did not discuss the introduction of plants and animals, his influential ideas can be detected in the way in which such introductions have been evaluated through to the present, implicating flora and fauna within the colonial project to civilise prehistoric Iron Age ancestors and to establish the historical landscape and identity of Britain.

An example is provided by the historian M.P. Charlesworth (1948, pp.71-3) who stresses "the debt we owe to the Romans" not simply for "flowers, vegetables, fruits, and trees...[and]...the beauty of our countryside" but also for shared tastes, aesthetics, and sentiments. For Charlesworth, this significant and beneficial ecological transplant is integral to British culture, history and identity, favourably positioning the Romans as 'our' ancestors within the conceptual framework of Romanisation. It should be stressed that Charlesworth was writing 60 years ago and it is no surprise that Romanisation has been subsequently critiqued by a generation of post-colonial archaeologists (e.g. Hingley 2000; Mattingly 2006). Beyond academia, however, popular perceptions continue to mirror Charlesworth's formulation of 'our debt': the Romans not only introduced plants and animals but also the accompanying civilisation with which to appreciate them. Food was transformed from subsistence to cuisine; gardens could be planted purely for the sake of ornament. As much as bath-houses and inscriptions, plants and animals underpin the popular narrative of Romanisation.

Yet if these flora and fauna are considered central to becoming a civilised provincial citizenry, or descendants thereof, at the City of Rome the same plants and animals were perceived quite differently. Many species had only arrived in Italy a few decades before they subsequently travelled to the north-western provinces. At Rome, new species such as cherry (*Prunus* spp.) and peach (*Prunus persica*) were perceived as neither civilising nor improving; indeed, their origins in the Greek East linked them with the excessive luxury associated with imperial adventure. The sumptuary laws of republican Rome reflect disquiet about declining moral standards and the social challenges raised by the consumption of expensive exotic foodstuffs (e.g. *lex Cornelia sumptuaria*, 81B.C.). Plants and animals must therefore be understood contextually across time and space; at Rome,

introduced species connote the decline of civilisation; in Britain, they represent the start. Significantly, both of these ideas – the corrosive effects of imperialism at the centre and its benefits on the colonial periphery – are established through ancient texts. For example, the idea of progressive Romanisation transforming the province of *Britannia* draws directly on authors such as Tacitus who characterise the island as peripheral and in need of civilisation (Clarke 2001).

However, critique of the theory of Romanisation, and its colonial underpinning, does not mean that Roman introductions might not be treated in some respects as a special case. As already noted, many of these species sit uncomfortably, culturally and ecologically, between exotic and mundane, and between alien and native. Indeed, it is striking that these species rarely progress from one category to another but remain intermediate: that is, introductions which are integral to the British landscape. Even species with which Shakespeare and his audience were familiar (Ellacombe 1884) still retain their status as Roman introductions today. This intermediate status is also reflected ecologically through the classification of Roman introductions as archaeophytes which, as noted above, often demonstrate behaviour which is distinct from both native and neophyte species (Preston *et al.* 2004, pp.262-3).

In summary, great cultural and political value has been attached to the agency of Rome in the introduction of species. Even though the extended presence of these plants and animals in the British landscape means that these species have been culturally incorporated into diet, folklore and history, there is continued emphasis on their introduced, or alien, status which can be explained by their perceived association with the civilising mission of the Roman empire. The cultural and symbolic value of these plants and animals would be lost were they reclassified as 'native'; the genealogical importance of Rome acts to confine these species to an intermediate category to preserve their cultural value. It is also relevant to note that popular and academic attention has focused on species which are assumed to have been deliberately rather than accidentally introduced, most obviously, plants for food, medicine or ornament, and animals for consumption, entertainment or display. Even the few Roman introductions which are considered to be pests today are provided with the cultural excuse that their introduction was well-intentioned, for example, ground elder (*Aegopodium podagraria*) as a vegetable.

Before moving on to examine the historical evolution of the concepts of the Roman introduction and the living legacy, it is instructive to consider attitudes in Scotland and Wales in order to gain perspective on the relationship between flora and fauna, and historical and contemporary British identities. Scotland and Wales have traditionally constructed their identities partly against the English, particularly because the latter assumed Rome's colonial mantle; as a result, English and Roman are frequently considered synonymous. Combined with strong Celtic heritage, it is no surprise that Rome's ecological contribution is perceived less positively than in England. 'Improvements' such as larger animal size are countered by other considerations such as reduced hardiness. Instead, pre-Roman species and breeds are valued as autochthonous and authentic, for example, Welsh pony and Black Welsh cattle are popularly held to pre-date the Roman conquest of Wales.ⁱⁱ Even with genetic analysis, however, the origins of ancient or traditional breeds have proven intractable. The Chillingham cattle of Northumberland illustrate the malleability of the genealogical claims placed upon such animals and the difficulties of disentangling them. For centuries, the origin of this isolated herd of White Park cattle has been debated and associated with regional and national identities (Ritvo 1992, including discussion of Bewick's famous woodcut, Figure 1). At various times, they have been claimed as pre-Roman, Roman or medieval in origin, though most recently attention has focused on genetic analysis in search of direct lineage

from extinct wild auroch (*Bos primigenius*) (e.g. Ludwig *et al.* 2013). For present purposes, the point is not whether these cattle, and similar 'unimproved' herds, are pre-Roman or Roman in origin, but rather the fact that at various times such possibilities have been found culturally and politically valuable.

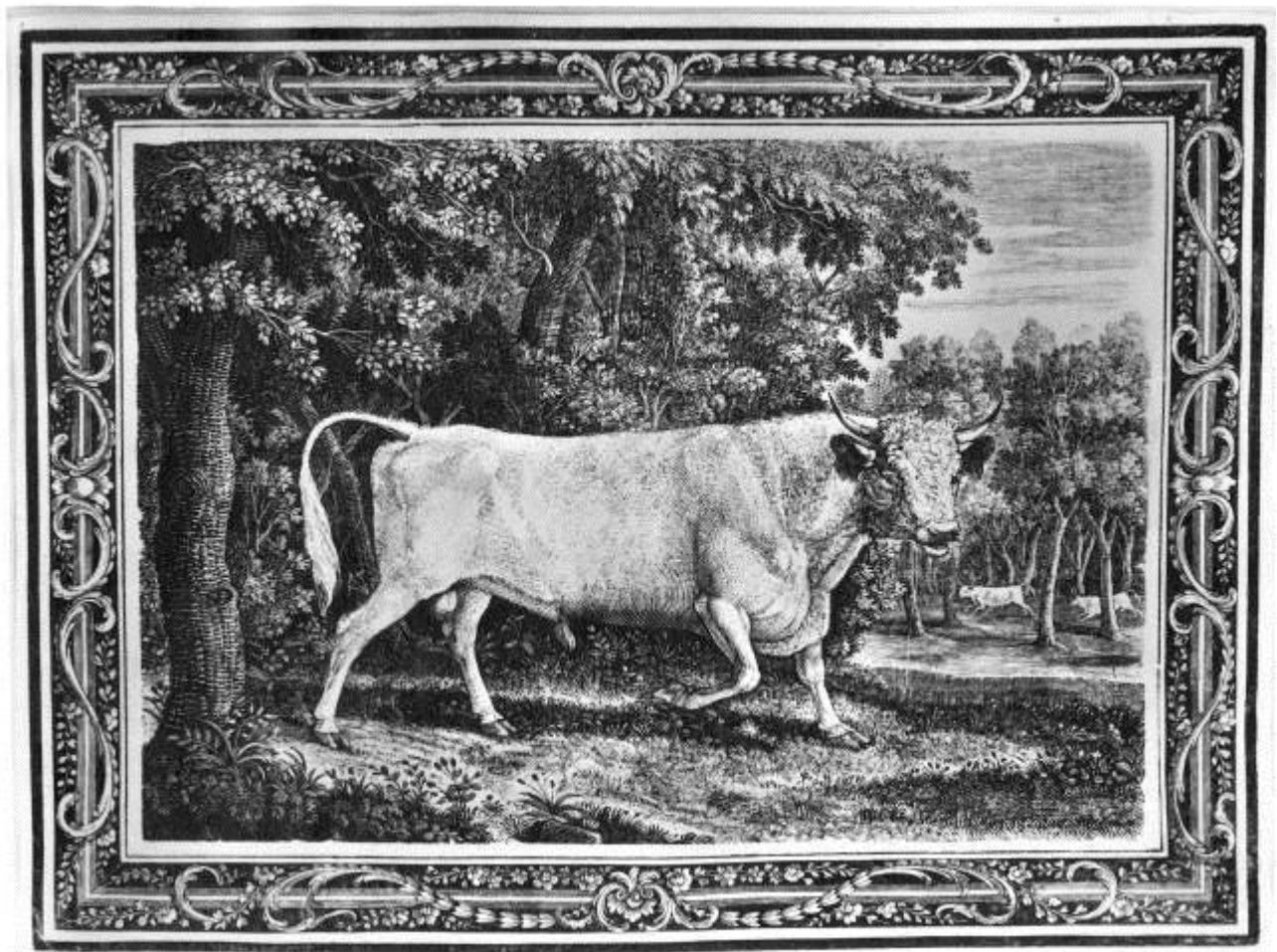


Figure 1. *Chillingham Bull*; woodcut on vellum by Thomas Bewick (© The Natural History Society of Northumbria, reproduced with permission).

Scotland also provides an elaborate counter-tradition which implicates the Romans/English in an existential threat to Scottish national identity through the destruction of the *Caledonia silva*, or Forest of Caldeon. Smout (2000) has traced the origins of this narrative back to the descriptions of thick pine forest in Tacitus, Dio and Herodian. Filtered through the work of Scottish scholars such as Hector Boece, these descriptions were infused with nineteenth-century German Romanticism to create a powerful identity myth: during campaigns north of Hadrian's Wall, the Roman emperor Septimius Severus ordered trees to be felled in order to track down the enemy; Nairne (1892) drew parallels with this earlier threat and the effects of felling to supply the English ironmasters following the suppression of the Jacobite rebellion over 1000 years later. In recent decades, projects have begun to recreate the forest through the replanting of native trees in Glen Finglas and Sunart (Crumley 2012). Yet, just as the concept of progressive Romanisation can be traced back to stock motifs in Roman texts, Smout (2000, pp.37-47) identifies the uncritical acceptance of ancient literary conventions of wooded and peripheral landscapes at the

heart of the *Caledonia silva* narrative. Again, for current purposes, the significance of this example lies in the creative use of texts, plants and animals to generate alternative traditions with which to counter the Roman genealogy of the English/British landscape.

3. Evolving evidence & concepts

The second half of this paper explores how the concepts of the Roman introduction and the living legacy have evolved and, in particular, the types of evidence which have been drawn upon to sustain them. Discussion is structured by category of evidence with a broad chronological trajectory; the individual examples discussed are inevitably selective but chosen to be indicative of wider trends. Two particular aspects which emerge are the early and persistent nature of these concepts and the frequent lack of clear distinction between lay and expert understanding.

3.1 Ancient authorities

Prior to Lucius Lucullus' victory against Mithridates, that is, until [*i.e.* 74 BC], there were no cherry-trees in Italy. Lucullus was the first to bring them back from Pontus, and in the span of 120 years they have crossed the ocean and have spread as far as Britain. (Pliny *Naturalis Historiae* 15.102, translated J.F. Healey 1991)

Hughes (2003) argues that Rome was a consumer of biodiversity using exotic species for competitive display on the dining table and in the arena; provinces were stripped of resources, pushing some species to extinction. But Rome not only drew exotic species into the imperial core, it also redistributed them around the provinces. Several ancient authors commented on this phenomenon in general, and with specific reference to Britain. For example, Pliny's discussion of the cherry (above) uses the introduction of the tree to the province of *Britannia* as evidence of both the speed and extent of its outward spread from Pontus (northern Turkey). For centuries, these sources have been influential on perceptions of Rome's role in the introduction of plants and animals to Britain. Often, however, these texts are ambiguous and they have been used in creative ways. For example, one text details a third-century edict of the emperor Probus (*SHA Prob.* 18.8) permitting the Gauls, Spaniards and Britons to cultivate grape vines (*Vitis vinifera*). Although Tacitus (*Agr.* 12) was emphatic that the vine was intolerant of the British climate, others have assumed that Probus' authorisation was swiftly, and logically, followed by the planting of vines and the production of wine (after all, why would citizens of the Roman empire *not* want to practice viticulture?). An example of how the British aristocracy could draw upon this classical knowledge is found at the Vyne, a large country-house in Hampshire, which was noted as the place "where as is said, the Romans grew the first vine in Britain" (Edinburgh Review 1860, p.392). One owner of the house, possibly John Chute (1701-1776), reinforced this singular claim by installing a recycled terracotta roundel of Probus made by Giovanni da Maiano in the 1520s (National Trust 2007, p.300; Figure 2).

Figure 2. Terracotta roundel of the Emperor Probus from the Vyne, Hampshire (© National Trust, reproduced with permission).

Another species named in the historical texts, if only as a temporary introduction, is the Elephant (Elephantidae). Polyaeus (*Strat.* 8.23.5) and Cassius Dio (60.21) state that both Caesar and Claudius brought elephants to Britain to instil awe in the conquered population. For both Roman and later audiences, these texts served to associate the first moments of contact between Rome and the Britons with the introduction of exotic animals. These elephants also provided inspiration for antiquarians seeking to explain the discovery

of giant (fossil) bones. In *The Natural History of Oxfordshire*, Robert Plot (1705, pp.134-7) discusses the possibility, which he finally rejects, that such bones were those of Claudius' elephants. The idea persisted in later books such as those by Weever (1767, p.184) and Ranking (1826), the latter noting the proximity of exotic animal bones to Roman towns, contending they were the remains of animals imported for amphitheatre games. The attribution of such exotic introductions to the Roman period was consistent with the prevailing concept of Biblical time, but by the early/mid-nineteenth-century, such ideas had become a block to the recognition of deep geological time; with the emergence of archaeology and geology as disciplines based on scientific concepts and methods (Schnapp 1996), the need to explain these fossil bones by appealing to ancient texts disappeared. These emergent fields of study also represent the beginning of the increasing specialisation of knowledge which has left the study of Roman introductions divided between disciplines.

I *Vrtica Romana.*
Romane Nettle.



Figure 3. Roman Nettle (*Urtica romana* syn. *Urtica pilulifera*) (Gerard 1597: 570).

Cherry, grape vine and elephant aside, ancient texts provide limited evidence for the introduction of plants and animals to Britain. Though the writings of Pliny and Dioscorides were crucial for early herbals, these botanical inventories focused on the description and

uses of plants, with little interest in whether these species were native or introduced. At most, a plant might be labelled 'romana' to indicate a foreign origin, for example, Gerard (1597, p.571) describes Roman nettle or *Urtica romana* (syn. *Urtica pilulifera*) which was so named "because it is rare and groweth in but fewe places, and the seed is sent from other countries and sown in gardens for his vertues" (Figure 3).

3.2 Places and plant-lore

It is said you can trace old Roman roads by the wild cherry trees that grew up from the stones spat out by legions as they marched across the country (The Telegraph 2009).

Popular stories have always been told about plants and animals which are perceived as rare, or which look or behave strangely. Rarity presumably explains the story told about wild chives (*Allium schoenoprasum*) growing on Hadrian's Wall. The antiquarian William Camden (1610) observed:

There continueth a settled perswasion among a great part of the people there about [*i.e.* Carvoran], and the same received by tradition, that the Roman souldiers of the marches did plant heere every where in old time for their use certaine medicinable herbes for to cure wounds.

Camden seems deliberately ambivalent about the veracity of this story. Elsewhere, however, he is more explicit; in relation to Roman nettle, he says:

Parkinson saith it hath been found growing of old at Lidde by Romney... Of the original whereof he tells us a very pleasant story. It is recorded that at Romney, Julius Cæsar landed with his Soldiers, and there abode for a certain time, whence the place was by them called Romania, and corruptly therefrom Romeny or Romney. But for the growing of this Nettle in that place, it is reported, That the Soldiers brought some of the Seed with them, and sowed it there for their use, to rub and chafe their Limbs, when through extreme cold they should be stiff and benumbed; being told before they came from home, that the Climate of Britain was so extreme cold, that it was not to be endured without some friction or rubbing to warm their blood, and to stir up their natural heat: since which time, it is thought, it hath continued there, rising yearly of its own sowing.

This Story hath nothing of likelyhood in it, because the Roman Nettle is found not only here, but in divers other places on the Sea-coast; nor, had it been a stranger or exotick, would it likely have continued so long, coming up yearly of its own sowing. Outlandish Plants usually failing, and being lost, if not cultivated in gardens. Add hereto that Julius Caesar landed not hereabouts.

While Camden enumerates the reasons that this "very pleasant story" lacks credibility, others have repeated such stories with less caution; for example, the Roman introduction of chives has become established fact in many Hadrian's Wall travelogues.



Figure 4. Field Eryngo (*Eryngium campestre*) (photo: author).

Proximity to Roman sites has also been used to rationalise and romanticise the presence of rare or unusual plants, including actual or suspected introductions. Anne Baker's (1854, p.386) *Glossary of Northamptonshire Words and Phrases* records that field eryngo (*Eryngium campestre*, Figure 4) was known as Dane-weed, but that "[a]s the old Roman road is the only known habitat for this rare plant, the Watling Street Thistle is a still more common local appellation". Although association with the Roman road was important, Baker does not claim that the plant was introduced or cultivated by the Romans; in contrast, Loudon (1838, I, pp.22-3) reflects directly on the sorb tree (or true service, *Sorbus domestica*) as both Roman introduction and living legacy. Referring to a famed

specimen growing in the Wyre Forest, Loudon notes the tree's proximity to a Roman site and suggests "[i]t is not improbable that the tree referred to may be a descendent from a service tree planted in the orchard belonging to the adjoining Roman villa".ⁱⁱⁱ The notion of direct descent from species introduced during the Roman period is found in other accounts. For example, documenting her visit to Chesters fort on Hadrian's Wall, Maria Hoyer (1908, p.5) recalls:

Also we looked with longing eyes at the little clusters of *Erinus Hispanicum* (or *Alpinus*) growing upon the walls, that tiny Spanish plant which has sprung up since the excavations, and which is believed to be a legacy from the Asturian Cohort, the Second Ala of which was long stationed at Cilurnum.

Here, an association is made between the fort's garrison, originally from northern Spain, and Fairy Foxglove (*Erinus alpinus*) which originates from a similar region; Mabey (1996: 333) notes the local vernacular name "Roman Wall plant".

This concept of living legacy can also be found in other European countries, and much more recently. Along the coast of northern Lazio, Italy, Allegrezza (2008) suggests that wild olive, pear and vine are relics of ancient Roman agriculture and in *Trees: A Lifetime's Journey through Forests, Woods and Gardens*, Johnson (2010, p.353) claims:

I know a hill in the centre of France where box [*Buxus sempervirens*] spills down into the country around ancient trees and their offspring, from what two thousand years ago was an important Gallo-Roman town. The town has totally disappeared – but not the box its gardeners planted.

Here, in contemporary plant-lore, the nature and significance of the living legacy is explicitly spelled out: the idea of direct inheritance, the ability of genes to outlast bricks and mortar, and the power of plants and animals to manifest and animate the past.

3.3 From etymology to ecofacts

[I]t cannot be mere chance that in Welsh, Flemish, and French the words for such delicious things as cherries, medlars, sweet chestnuts, and vines all go back to common origins in Latin (Charlesworth 1948, p.71-2).

In *The History of Manchester*, John Whitaker (1773, p.87) identified a number of species such as peacock (*Pavo cristatus*) which "declare their origins in their names".^{iv} Whitaker argued that similarities between the Latin names of plants and animals with Welsh, Irish and Breton terms indicated that those species were introduced by the Romans. Using this method, combined with Varro's (*Rust.* 3.12.7) comment that rabbits (*Oryctolagus cuniculus*) followed people from Spain to other parts of the Roman world, Whitaker appears to have been the first to suggest that the Romans introduced the species to Britain (Whitaker 1773, pp.87-8, 104). This etymological linguistic approach to the identification of introductions dominated for at least 200 years, and well into the twentieth-century; during the 1940s, Charlesworth (1948, p.73) could point to the potential of archaeology but was forced to admit that "for the moment, we must rely mainly on linguistic evidence".

Reliance on popular stories and linguistic similarities did not appeal to the sciences of botany and zoology, and it is therefore unsurprising that Roman introductions are rarely mentioned in the proliferation of British natural histories of the late-nineteenth and early-twentieth-centuries (e.g. Barrett-Hamilton 1910, Dunn 1905). Here was another point at which study of Roman introductions was marginalised as a result of the specialisation of knowledge. The dominance of linguistic evidence persisted as late as 1970, when J.P. Wild reviewed and formalised the concept of Latin loan-words for the identification of Roman introductions. His conclusion that a "loan-word which denotes a concrete object

may with reasonable probability be taken as evidence in itself that the object, too, was borrowed” was judged particularly valuable because:

it supplies the archaeologist with a means of checking some of his archaeological conclusions and gives him a means of tackling the fields where physical evidence is sparse (Wild 1970: 125).

Certainly, during the first half of the twentieth-century, the emergent discipline of archaeology contributed little to the identification of Roman introductions. Notwithstanding the precocious archaeobotanical studies at Silchester (Reid 1901, 1903), field archaeology lacked both the methods and the motivation to collect and identify seeds and bones. The subject is unmentioned in standard syntheses of Roman Britain by Haverfield (1906) and Collingwood & Myres (1936). Instead, scholars of Roman Britain were concerned with political context, military fortifications and site typologies. Agricultural developments were seen to focus on new technologies or the organisation of labour rather than the types of crops introduced and grown. And if those introductions were few, Rome’s broader legacy was considered similarly limited; W.G. Hoskins’ (1955) *The Making of the English Landscape* attributed minimal enduring significance to the Roman occupation: “the Anglo-Saxons moved into a country which was generally still a wilderness, with almost everything yet to be done” (1985, 42). The near contemporary evaluations of Rome’s legacy by the historian Charlesworth (1948) and the fieldworker Hoskins (1955) could scarcely be more different.

By the time scholars had begun to develop a more critical attitude towards the ancient sources (e.g. Rivet 1958, p.125 on Pliny *NH* 15.102) and to formalise the concept of loan-words (Wild 1970), an archaeological revolution was underway. The rapid development of archaeobotany and zooarchaeology during the final decades of the twentieth-century set the study of the flora and fauna of Roman Britain on an empirical basis. In an inversion of Wild’s claim for the importance of loan-words to compensate for the lack of archaeological data, four decades of archaeological research has generated large databases with which to evaluate conclusions based on sparse linguistic evidence. Recent synthesis of the archaeobotanical evidence lists c.50 species as Roman introductions (van der Veen 2008); reassuringly many correspond with those species identified as introductions on the basis of loan-words.

Yet, despite the strong empirical foundations of archaeobotany and zooarchaeology, the evidence of pollen, seeds, macrofossils and animals bones must be critically assessed in the same way as any other source; importantly, caution is required before the evidence is situated within the established frameworks of the Roman introduction and the living legacy. For example, the presence of fig (*Ficus carica*) seeds in Roman Britain points to the consumption of the fruit (van der Veen *et al.* 2008) but these seeds cannot be taken as evidence for cultivation in Britain. In the Mediterranean, fig trees are pollinated by a specific wasp; without such pollination, figs do not produce hard, archaeologically-visible, seeds (Dickson & Dickson 1996). In other words, unless it is assumed the wasp was successfully introduced alongside the fig, it is necessary to find macrofossils such as twigs in order to demonstrate the successful transplantation of fig trees to Roman Britain (as noted by Reid 1903: 427). Similarly, even if the earliest archaeological evidence for a species is found on a Roman site, caution is needed before it can be confidently labelled as a Roman introduction. For example, there is long-running debate about whether the rabbit was introduced by the Romans, the Normans, or both. The occasional discovery of rabbit bones from Roman sites generates much interest (e.g. Lynford, Norfolk, British Archaeology 2006). However, such discoveries, especially of burrowing animals, require special caution in order to ensure they are not archaeologically intrusive.

Another issue is that confidence in the comparatively large datasets from the Roman period may encourage unwarranted confidence in the records from earlier and later periods; however, in many cases, especially the Iron Age, the record is simply too fragmentary to be certain that some species really were missing and therefore had to be introduced in the first place (e.g. brown hare, Yalden 1999, p.128) or that species had to be reintroduced following post-Roman extinction. Similarly, the archaeobotanical evidence dates the earliest records for a number of arable weed species including corn buttercup (*Ranunculus arvensis*) and caper spurge (*Euphorbia lathyris*) to the Roman period (Preston *et al.* 2004). This could represent the accidental importation of weed seeds with grain (e.g. Helbaek 1964). Alternatively, it may reflect changes to crop management which allowed existing weed species to proliferate, or may have resulted from new practices such as building large granaries which provided opportunities for native species to thrive and become archaeologically visible (Evans 1999, p.126). All of these examples suggest the Roman introduction might not be the only explanatory framework available.

Without doubt, archaeological evidence provides the best means of cataloguing and evaluating the flora and fauna of Roman Britain. Yet as a relative newcomer, archaeology has tended to work within, rather than to challenge, the established models of the Roman introduction and the living legacy. For example, the fascination with exotic species perpetuates an emphasis on rare animals and plants. Yet even if the attested examples of fallow deer (*Dama dama*), pheasant (*Phasianus colchicus*) and peacock were increased by an order of magnitude, or even two, their numbers would remain vanishingly small. Their archaeological rarity suggests that they were highly-prized specimens valued for social display with limited significance for the wider ecology of Roman Britain. Recent syntheses make clear that species such as almond (*Prunus dulcis*), fig and peach were largely restricted to high-status sites such as towns, forts and villas which are all over-represented in the archaeological record compared with the villages and farms where the majority lived (Hingley 2000, table 10.3; van der Veen 2008, pp.97-8; van der Veen *et al.* 2008). As with the use of archaeological evidence in support of the concept of Romanisation more generally, the selective use of the archaeobotanical evidence can mispresent elite lifestyles as typical of the majority.

Aware of such issues, many archaeobotanists and zooarchaeologists have been careful to reject interpretation of their results in terms of Romanisation (e.g. van der Veen 2008). Nonetheless, some findings, such as the very early appearance of exotic fruits and the introduction of larger breeds of farm animals (Bakels & Jacomet 2003; Livarda 2011; Livarda & van der Veen 2008) can be intentionally or inadvertently deployed in support of the Romanisation narrative, reaffirming an uncritical acceptance of the ecological and cultural contribution of Rome as enriching and beneficial.

Conversely, in recent years, archaeologists have identified a number of species which challenge the idea that all Roman introductions were welcome additions. Examples include black rat (*Rattus rattus*, Yalden 1999) and various insects including granary weevil (*Sitophilus granarius*), saw-toothed grain beetle (*Oryzaephilus surinamensis*) and dark mealworm (*Tenebrio obscurus*, King 2010; Smith & Kenward 2011). Few of these species has achieved any significant popular recognition. Undoubtedly, this situation can be explained by the relative obscurity of some of these species, and by the recent date of discoveries; however, their incongruity with the notion of the beneficial Roman legacy is also a significant consideration.

Finally, it is worth noting that, though a notable number of species were introduced during the Roman period, in reality new attitudes towards native or previously introduced species were probably equally significant in terms of diet. The most obvious examples are a new-

found passion for shellfish such as native oysters (*Ostrea edulis*, Alcock 1998), a shift in preference from mutton to beef (King 1999), and a significant increase in evidence for consumption of domestic fowl (chicken) (Yalden & Albarella 2010: table 5.1). Despite their often miniscule quantitative significance, introduced species have stolen the limelight; they are often easier to spot in the archaeological record and the identification of the earliest or only example of a species understandably makes for more interesting academic papers; nonetheless, the introduction of new attitudes was as important as the introduction of new species.

3.4 Genes and memes

The notion of the living legacy is romantic and political in equal measure but rarely empirical: the archaeological record is simply too fragmentary to demonstrate the uninterrupted presence of many species across two millennia. However, genetic studies promise the identification of DNA enduring directly from past to present. For example, a widely-cited study of the English/common elm (*Ulmus procera*) concludes that all British elms are genetic clones descended from root suckers brought from Italy, via Spain, by the Romans (Gil *et al.* 2004). The analysis identifies several DNA lineages, each with distinct distributions; one of these lineages is present in Italy, Spain and Britain, but not France. For explanation, Gil *et al.* turn to Columella (*de arb* 16) who discusses the propagation of Atinian elm for training grape vines. The authors also note that Columella farmed in both Italy and Spain observing that “he and other farmers may have introduced different Italian elms to the Iberian peninsula” from where the clone:

was probably transported to Britain in the form of root suckers as indicated by the presence of elm pollen in a vineyard in Britain and by the coincident distribution of suspected Roman vineyards and *U. procera* in Britain (Gil *et al.* 2004: 1053).

Whilst genetic analysis is able to establish lineages and spatial distributions, it cannot independently date these patterns with any precision and geneticists must turn to archaeological and textual evidence. In this case, Columella is irresistible. A historical individual, whose writings address the uses of elm and who connects at least one of the geographical steps, is combined with archaeological evidence for another introduced species, grape vine, in order to articulate a coherent narrative about the introduction and “massive propagation of the Atinian elm by the Romans” in Britain (Gil *et al.* 2004).

This interpretation makes a number of problematical assumptions including the acceptance of Columella’s text as descriptive rather than prescriptive, and its selective use to emphasise the role of elm in vine-cultivation rather than, for example, foddering. It also assumes Columella used identical agricultural regimes on his Italian and Spanish estates. The authors then postulate an Atlantic journey to transport the root suckers to Britain where the co-presence of elm and vine pollen from the probable Roman vineyard at Wollaston, Northamptonshire (Brown *et al.* 2001) is taken to indicate the use of elm to train vines. The presence, however, of four grains of elm pollen on a Roman site does not demonstrate that elm was a Roman introduction; nor does its presence at a vineyard mean that elm was used to support vines.^v The similar distributions of elm and Roman vineyards across south-east Britain is also far from conclusive as the majority of all alien species concentrate in this region.

In effect, Gil *et al.* rely on the established notions of the Roman introduction and the living legacy to provide chronology and significance for their genetic distributions. Spatial patterning of DNA lineages is matched to historical texts to provide a chronological framework. Invoking the Romans also provides ready-made explanation for the movement of species – the notions of improvement and civilisation inherent within the concept of Romanisation. Yet it is never made clear why the Romans were the most likely vector;

people and goods have moved around the Mediterranean and along the Atlantic façade for millennia allowing species to reach Britain before and after the Roman period. For example, the house mouse (*Mus musculus*) first arrived during the Iron Age (Yalden 1999, pp.124-5) as did some 15 plant species (Preston *et al.* 2004, p.278). The Roman period clearly witnessed an acceleration of introductions but the arrival of new species was not constrained by formal historical periodisation. For current purposes, the issue is not whether elm was first introduced during the Roman period but rather the way in which even the most recent scientific techniques remain dependent upon archaeological and textual evidence and, more importantly, how the results are framed within established conceptual frameworks.

3.5 Rekindling the legacy

To demonstrate unbroken genetic descent across two millennia is not easy and there may have been breaks in these lineages. For example, the Romans may have introduced the grape vine to north-western Europe but that genetic legacy is far from direct because the nineteenth-century blight which destroyed French vineyards was tackled by grafting European vines onto resistant American rootstock. However, the power of the *living* legacy is that it can be resuscitated. For example, gardeners can buy Emperor's Mint which was “originally found flourishing amidst the ruins of Emperor Hadrian’s remarkable summer villa near Rome” (Chiltern Seeds 2012). Even greater authenticity can be achieved by growing ‘Roman’ crops on ‘Roman’ sites: a vineyard located next to the Roman city of Viroconium (Wroxeter, Shropshire) claims “the Romans took the vine wherever they went”; the replanting of the vineyard is therefore “the close of a 2000 year arc” (Wroxeter Vineyard 2012). Glebe Farm in Cambridgeshire markets Roman-themed products, including Emperor Lager; the label explains:

Spelt [*Triticum spelta*] is a grain, originally grown by the Romans for bread and beer. The land at Glebe Farm was farmed by the Romans who left their legacy with coins still being discovered today. Their memory lives on in this spelt lager.

Here, authenticity is even further enhanced through the discovery of Roman coins, a kind of ‘parallel crop’.



Figure 5. Emperor Lager bottle label (with kind permission of Glebe Farm, Cambridgeshire).

Another example of the use of plants to rekindle Rome's legacy is the planting of Roman gardens at archaeological sites including Brading (villa), Caerleon (fortress), Fishbourne (palace), Cirencester and Silchester (towns). Some of these gardens are formal, planned spaces combining the evidence of archaeology and historical texts. For example, at Fishbourne, Sussex, Cunliffe (1971, pp.138-9) notes that the poor preservation of archaeological plant remains required direct reliance on Pliny the Younger's description of his Laurentine villa for the replanting scheme. Other gardens focus on medicinal plants or imaginative creations evoking colour and richness. In their different ways, such gardens represent Roman ideas of order, knowledge and pleasure. The rich cultural values communicated by these gardens are thrown into relief by comparison with reconstructions of prehistoric farms (e.g. Butser, Hampshire). The latter focus on traditional cereals and unimproved animal breeds; they are concerned with subsistence not senses, survival rather than civilisation. Charlesworth's (1948) shared tastes, aesthetics, and sentiments may be academically unfashionable but they continue to underpin both popular perceptions and heritage representations.

4. Conclusions

A fig tree born in the very forum and comitium of Rome is cultivated, sacred because of... the memorial tradition of that tree which, nurse of Romulus and Remus, first sheltered the founders of the empire at the Lupercal... with the miracle portrayed in bronze nearby, as if the tree had of its own accord crossed into the comitium... Nor without some omen does it wither and get replanted by the care of the priests. (Pliny *Naturalis Historiae* 15.77, translated A. Hunt 2012)

Pliny's story well illustrates the core elements of the living legacy: the link between past and present, the ability to relocate the legacy (even trees!), the ominous omen of allowing the legacy to die but also the ability to replant and restore it. Through discussion of the movement of plants such as cherry, Pliny also helped establish the recurrent notion of the Roman introduction as well. Over the past 400 years, these concepts have been reworked through stories about strange plants, bones excavated from the ground, and advanced scientific analysis. These twin notions remain powerful and demonstrate wide currency from popular stories to scientific journals. In each case, the aim is to make sense of British diet, ecology or landscape through reference to connections with, or isolation from, the ancient past and the neighbouring Continent. Interest in these themes has waxed and waned in relation to available evidence, the emergence of disciplines, and wider discourses on identity and the Roman past. The early-twenty-first century has witnessed renewed fascination; this might be attributed to reduced emphasis on Anglo-Saxon heritage and greater awareness and concern about food and environment, including both the pleasure of exotic foods and the dangers of alien species.

The attraction of plants and animals as a medium for interacting with the past is that these species need not be spatially restricted in the same ways as monumental Roman ruins. Plants and animals offer a more flexible connection with the Roman past. They can be both everywhere and nowhere, a general ecological inheritance which can be found in hedgerows and gardens or stacked on the supermarket shelf. Moreover, whilst archaeological remains can be built over and lost forever, the living legacy can be rekindled. In these senses, plants and animals are the most accessible and enduring of Rome's legacies.

Although the sources of evidence and methods for identifying Roman introductions and assessing their legacy have evolved, the core group of plants and animals concerned has remained largely stable. Long-standing debate about whether the Romans introduced species such as the rabbit remain unresolved because of the fragmentary nature of the archaeological record. Techniques such as genetic analysis do not necessarily offer an

independent means to assess these debates because they must rely on the same historical and archaeological evidence. But more importantly, it is not simply that the data or methods are deficient, but rather that the established interpretive frameworks have not evolved.

The archaeological record for the plants, animals and landscapes of Roman Britain provides a rich and expanding resource; archaeobotany and zooarchaeology have established themselves as central to the study of Rome's ecological impact. The challenge is to find new ways to frame this evidence. Progress might involve three components: first, the definition of introductions and legacies as a discrete and coherent field of research; core to this must be to bridge the fragmentation of studies to create a truly interdisciplinary enterprise. Second, the deconstruction of the intellectual biographies through which evidence is currently understood and the reframing of research questions; this requires genuine dialogue between diverse scholars: archaeologists, ecologists, ethnographers, folklorists, geneticists, linguists, and historians – natural, ancient, medieval and modern. Finally, the transformation and communication of knowledge about the landscape of Roman Britain and, more ambitiously, the utilisation of existing popular awareness of Roman introductions and legacies as way of engaging with and advancing much broader issues of contemporary concern, such as alien versus native species, the changing character of the British landscape, and even national identity in a globalised world. Communicating knowledge about the Roman landscape should not simply be an exercise in looking back to the past in search of genealogical roots, but also the basis for debate and education about the future of the historical landscape too.

Acknowledgements

I would like to thank everyone who has taken time to discuss the ideas presented here, including the audience of seminar at St Andrews, especially Jon Coulston and Greg Woolf. Alice Hiley, Richard Hingley and Tony Wilkinson read and commented on draft versions of the text. Thanks also to the Natural History Society of Northumbria, Glebe Farm, and Aurelio Manzi for assistance with the images. Any errors are the author's responsibility.

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Table 1. Selection of species which have been labelled as Roman introductions The list includes a variety of species commonly believed to be Roman introductions; in addition, all species discussed in the text (), regardless of whether the claim is common or not, are included. Notes are intended to give a sense of the debate and complexity involved in classifying species as Roman introductions; particular issues concern inability to distinguish native wild forms from introduced and/or improved cultivars or breeds, and inadequate evidence base for reliable assessment (some species are documented by <10 examples, and some by only one).*

Species	Comment
Alexanders <i>Smyrniolus olusatrum</i> L.	Preston <i>et al.</i> (2002: 458) classify as an archaeophyte, introduced during the Roman period for culinary purposes.
*Almond <i>Prunus dulcis</i> (Mill.) D.A.Webb	van der Veen <i>et al.</i> (2008: table 1) classify as a Roman introduction (syn. <i>Amygdalus communis</i> L.).
Apple <i>Malus</i> spp.	<i>M. sylvestris</i> Miller <i>sens. lat.</i> (Crab apple) is native; <i>M. domestica</i> Borkh. (Apple) is introduced, though difficult to differentiate archaeologically & genetically (Preston <i>et al.</i> 2002: 357).
Asparagus <i>Asparagus officinalis</i> L.	Preston <i>et al.</i> (2002: 827) classify as an archaeophyte, cultivated during the Roman period; van der Veen <i>et al.</i> (2008: table 1) also list Roman usage, but suggest wild form is native.
Black Mulberry <i>Morus nigra</i> L.	Preston <i>et al.</i> (2002: CD) classify as a neophyte, but probably cultivated long before first record in 1548; van der Veen <i>et al.</i> (2008: table 1) list as a Roman introduction.
*Black rat <i>Rattus rattus</i> (Linnaeus, 1758)	Archaeologically attested at C3 London & C4 York (Yalden 1999: 125).
*Box <i>Buxus sempervirens</i> L.	Preston <i>et al.</i> (2002: 426) suggest it is native at some sites, but widely planted since the Roman period; van der Veen <i>et al.</i> (2008: table 1) classify as probable introduction.
*Brown hare <i>Lepus europaeus</i> Pallas, 1778	Status debated. Long associated via texts (e.g. Caesar's <i>Gallic Wars</i>) with Iron Age divination and coursing; today, widely cited as a Roman introduction (see Buczacki 2002: 483-4). Yalden (1999: 127) suggests evidence is too fragmentary to be certain that it was native or pre-Roman/Roman introduction.
*Caper spurge <i>Euphorbia lathyris</i> L.	Weed, with expanding range. Preston <i>et al.</i> (2002: 103) classify as an archaeophyte; Preston <i>et al.</i> (2004: table 2) notes first record dates to Roman period.
Carrot <i>Daucus carota</i> L. Parsnip <i>Pastinaca sativa</i> L.	Native wild carrot & parsnip cannot be distinguished from cultivated forms, though wild forms are unlike large fleshy roots familiar today; increase in evidence from Roman period sites suggests expanded cultivation (van der Veen <i>et al.</i> 2008: 28).
*Cherry, plum, damson <i>Prunus</i> spp.	Closely related group of species including wild cherry (<i>P. avium</i> L.) which is native, and sour cherry (<i>P. cerasus</i> L.) plum (<i>P. domestica</i> L. ssp. <i>domestica</i>) and damson (<i>P. domestica</i> L. ssp. <i>insititia</i>) which are Roman introductions (van der Veen <i>et al.</i> 2008: table 1).
*Chicken / Domestic fowl <i>Gallus gallus</i> (Linnaeus, 1758)	Introduced to Britain during later prehistoric period, but significant increase in consumption during Roman period (Sykes 2012; Yalden & Albarella 2010: table 5.1).
Common carp	Introduced species, date is uncertain. Archaeologically, Cyprinidae (carp family) are difficult to identify to species; Locker (2007: 149) suggests the

<i>Cyprinus carpio</i> Linnaeus 1758	identification of Common carp from Lincoln, several centuries before any other attestation, is probably native barbel (<i>Barbus barbus</i> Linnaeus 1758)
Coriander <i>Coriandrum sativum</i> L.	Preston <i>et al.</i> (2002: 458) classify as a neophyte, but note presence by 995; van der Veen <i>et al.</i> (2008: table 1) classify as a Roman introduction.
*Corn buttercup <i>Ranunculus arvensis</i> L.	Arable weed in steep decline. Preston <i>et al.</i> (2002: 103) classify as an archaeophyte, present since the Roman period.
Cucumber <i>Cucumis sativus</i> L.	Preston <i>et al.</i> (2002: CD) classify as an archaeophyte; can be confused with other species such as <i>C. melo</i> L.(melon); van der Veen <i>et al.</i> (2008: table 1) list as a Roman introduction.
*Dark mealworm <i>Tenebrio obscurus</i> Fabricius, 1792	Very early Roman presence at sites such as Colchester and London points to arrival with military grain supply (King 2010).
Edible dormouse <i>Glis glis</i> (Linnaeus, 1766) Garden dormouse <i>Eliomys quercinus</i> (Linnaeus, 1766)	Neither species is native. <i>Glis glis</i> is the species eaten by Roman gourmets in Italy, but no known examples from Roman Britain; introduced to UK in early C20. <i>Eliomys quercinus</i> attested at Roman York & South Shields; introduction probably accidental & unlikely to have been food source or to have established feral populations (Yalden 1999: 126).
*Elephant Elephantidae Gray, 1821	Mentioned by Polyaeus and Cassius Dio in relation to both Caesar's and Claudius's invasions; no archaeological evidence.
*English / Common elm <i>Ulmus procera</i> Salisb.	Preston <i>et al.</i> (2002: 125) consider it native to SE Britain; Gil <i>et al.</i> (2004) suggest Roman introduction from Italy via Spain.
*Fairy foxglove <i>Erinus alpinus</i> L.	Preston <i>et al.</i> (2002: 551) classify as a neophyte (cultivated by 1739); native to SW/S central Europe.
*Fallow deer <i>Dama dama</i> (Linnaeus, 1758)	Small number of attested examples from Roman Britain; isotopic analysis suggests some individuals imported & others raised in Britain (Sykes <i>et al.</i> 2011).
Fennel <i>Foeniculum vulgare</i> Mill.	Preston <i>et al.</i> (2002: 464) classify as archaeophyte and Roman introduction; van der Veen <i>et al.</i> (2008: table1) as a probable Roman introduction.
*Field eryngo <i>Eryngium campestre</i> L.	Rare species confined to S Britain. Preston <i>et al.</i> (2002: 456) classify as archaeophyte and Preston <i>et al.</i> (2004: table 2) note non-existent fossil record.
*Fig <i>Ficus carica</i> L.	Preston <i>et al.</i> (2002: 127) classify fig as a neophyte, noting fruits were imported during the Roman period (see also van der Veen <i>et al.</i> 2008). Unclear whether fig was cultivated in Roman Britain, see Dickson & Dickson 1996.
*Granary weevil <i>Sitophilus granarius</i> (Linnaeus, 1758)	Very early Roman presence at sites such as Colchester and London points to arrival with military grain supply (King 2010).
*Ground elder <i>Aegopodium podagraria</i> L.	Preston <i>et al.</i> (2002: 460) classify as archaeophyte introduced during Roman period for medicinal and culinary use.
*Grape vine <i>Vitis vinifera</i> L.	Pollen evidence from Wollaston, Northamptonshire in association with trenches of probable vineyard (Brown <i>et al.</i> 2001). Preston <i>et al.</i> (2002: 433) classify as neophyte.
*Native oyster <i>Ostrea edulis</i> (Linnaeus, 1758)	Sometimes assumed to be a Roman introduction due to popularity during Roman period; however, it is a native species which developed as a food source following the Conquest (Alcock 1998)
*(Oilseed) rape	Vegetable crop attested from Roman Britain (van der Veen <i>et al.</i> 2008: table1), though Preston <i>et al.</i> 2002: 279 list as a neophyte.

<i>Brassica napus</i> L.	
(Opium) poppy <i>Papaver somniferum</i> L.	van der Veen <i>et al.</i> (2008: table) classify as a probable Roman introduction; Preston <i>et al.</i> (2002: 115); Preston <i>et al.</i> (2004: table 2) point to presence in Bronze & Iron ages.
*Peach <i>Prunus persica</i> (L.) Batsch	van der Veen <i>et al.</i> (2008: table 1) document consumption of peach but cultivation uncertain (syn. <i>Persica vulgaris</i> Mill.).
*Peacock <i>Pavo cristatus</i> Linnaeus 1758	Yalden & Albarella (2010: table 5.1) list two attested examples from Roman Britain
Pear <i>Pyrus communis</i> spp.	An archaeophyte; wild pear (<i>P. pyraster</i> (L.) Burgsd.) & cultivated pear (<i>P. communis</i> L.) hard to differentiate (Preston <i>et al.</i> 2002: 357). van der Veen <i>et al.</i> (2008: table 1) list as a Roman introduction.
*Pheasant <i>Phasianus colchicus</i> Linnaeus, 1758	Yalden & Albarella (2010: table 5.1) list eight attested examples from Roman Britain (& one from Iron Age Britain)
*Rabbit <i>Oryctolagus cuniculus</i> (Linnaeus, 1758)	Rabbit from Roman sites have proved to be intrusive (see Yalden 1999); evidence from Lynford awaits publication (<i>Brit Arch</i> Jan/Feb 2006). Buczacki (2005: 490) suggests C12 introduction.
*Roman snail <i>Helix pomatia</i> Linnaeus, 1758	Commonly thought to have been introduced during the Roman period as a food source though Buczacki (2005: 32) expresses doubt; protected since 2008 under the Wildlife and Countryside Act, 1981 as it is endangered in its native range.
*Saw-toothed grain beetle <i>Oryzaephilus surinamensis</i> (Linnaeus, 1758)	Very early Roman presence at sites such as Colchester and London points to arrival with military grain supply (King 2010).
*Spelt <i>Triticum spelta</i> L.	Spelt was well-established as a crop in later prehistoric Britain, but was of increased significance during the Roman period (Dark & Dark 1997: 109-110).
*Sorb (true service) <i>Sorbus domestica</i> L.	Long thought to be a purely introduced species, a native population was discovered during the 1980s (Mabey 1996: 206-7; Preston <i>et al.</i> 2002: 357).
Sweet chestnut <i>Castanea sativa</i> Mill.	An archaeophyte, probably a Roman introduction (Preston <i>et al.</i> 2002: 130); van der Veen <i>et al.</i> (2008: table 1) list as Roman introduction.
Sycamore <i>Acer pseudoplatanus</i> L.	Commonly suggested to be a Roman introduction, though Preston <i>et al.</i> (2002: 439) classify it as a neophyte, first recorded in the wild in 1632.
Walnut <i>Juglans regia</i> L.	Preston (<i>et al.</i> 2002: 128) classify as a neophyte, though noting use in gardens since Roman times; van der Veen <i>et al.</i> 2008: table 1 list as Roman introduction.
White mustard <i>Sinapis alba</i> L.	A weed formerly grown as a condiment or salad plant. Preston <i>et al.</i> (2002: 281) classify as an archaeophyte; van der Veen <i>et al.</i> (2008: table 1) classify as a Roman introduction.
*Wild chives <i>Allium schoenoprasum</i> L.	Native species, though occurs as an alien on roadsides (Preston <i>et al.</i> 2002: 819).

Endnotes

ⁱ For recent syntheses on the introduction of mammals and birds to Britain, see O'Connor & Sykes (2010), Yalden (1999) and Yalden & Albarella (2010). For summaries of archaeological evidence for Roman

Britain: fish (Locker 2007); insects (Smith & Kenward 2011); plants and exotic foodstuffs (Preston *et al.* 2004; van der Veen *et al.* 2008). For non-native species across the EU, see DAISIE (2009).

- ii The idea that improvement comes at a cost is reflected in the recent popularity of 'Iron Age' pigs. The cross-breed between Tamworths and wild boar produces pork for the speciality market which is more strongly-flavoured and fatty than meat from modern breeds. Here, labelling the cross-breed as Iron Age, i.e. pre-Roman, evokes simplicity and authenticity.
- iii Loudon (1938: 32) also makes a more general statement about the 'springing up of Italian plants in the neighbourhood of the ruins of Roman villas'.
- iv For comments on the context of Whitaker's book, see Hingley 2008: 220-1.
- v The 'marriage' of elm and vine is found widely in literature. Ellacombe (1884: 87-8) suggests that the association of elm and vine found in Shakespeare and Milton owes more to ancient texts than actual practice in Britain.